



Concepts

Astra Control Center

NetApp
February 12, 2024

Table of Contents

- Concepts 1
 - Intro to Astra Control 1
 - Architecture and components 4
 - Validated vs standard apps 5
 - Storage classes and persistent volume size 6

Concepts

Intro to Astra Control

Astra Control is a Kubernetes application data lifecycle management solution that simplifies operations for stateful applications. Easily protect, back up, and migrate Kubernetes workloads, and instantly create working application clones.

Features

Astra Control offers critical capabilities for Kubernetes application data lifecycle management:

- Automatically manage persistent storage
- Create application-aware, on-demand snapshots and backups
- Automate policy-driven snapshot and backup operations
- Migrate applications and data from one Kubernetes cluster to another
- Easily clone an application from production to staging
- Visualize application health and protection status
- Use a user interface or an API to implement your backup and migration workflows

Astra Control continually watches your compute for state changes, so it's aware of any new apps that you add along the way.

Deployment models

Astra Control is available in two deployment models:

- **Astra Control Service:** A NetApp-managed service that provides application-aware data management of Kubernetes clusters in Google Kubernetes Engine (GKE) and Azure Kubernetes Service (AKS).
- **Astra Control Center:** Self-managed software that provides application-aware data management of Kubernetes clusters running in your on-premises environment.

	Astra Control Service	Astra Control Center
How is it offered?	As a fully managed cloud service from NetApp	As software that you download, install, and manage
Where is it hosted?	On a public cloud of NetApp's choice	On your provided Kubernetes cluster
How is it updated?	Managed by NetApp	You manage any updates
What are the app data management capabilities?	Same capabilities on both platforms with exceptions to backend storage or to external services	Same capabilities on both platforms with exceptions to backend storage or to external services
What is the backend storage support?	NetApp cloud service offerings	NetApp ONTAP AFF and FAS systems

Supported apps

Astra Control Center does not support apps that are deployed with Operator Lifecycle Manager (OLM)-enabled operators or cluster-scoped operators.

NetApp has validated some apps to ensure the safety and consistency of the snapshots and backups.

- [Learn the difference between a validated app and a standard app in Astra Control Center.](#)

No matter which type of app that you use with Astra Control, you should always test the backup and restore workflow yourself to ensure that you can meet your disaster recovery requirements.

How Astra Control Service works

Astra Control Service is a NetApp-managed cloud service that is always on and updated with the latest capabilities. It utilizes several components to enable application data lifecycle management.

At a high level, Astra Control Service works like this:

- You get started with Astra Control Service by setting up your cloud provider and by registering for an Astra account.
 - For GKE clusters, Astra Control Service uses [NetApp Cloud Volumes Service for Google Cloud](#) as the backend storage for your persistent volumes.
 - For AKS clusters, Astra Control Service uses [Azure NetApp Files](#) as the backend storage for your persistent volumes.
- You add your first Kubernetes compute to Astra Control Service. Astra Control Service then does the following:
 - Creates an object store in your cloud provider account, which is where backup copies are stored.

In Azure, Astra Control Service also creates a resource group, a storage account, and keys for the Blob container.
 - Creates a new admin role and Kubernetes service account on the cluster.
 - Uses that new admin role to install [Astra Trident](#) on the cluster and to create one or more storage classes.
 - Uses Astra Trident to provision persistent volumes for your apps.
- At this point, you can add apps to your cluster. Persistent volumes will be provisioned on the new default storage class.
- You then use Astra Control Service to manage these apps, and start creating snapshots, backups, and clones.

Astra Control Service continually watches your compute for state changes, so it's aware of any new apps that you add along the way.

Astra Control's Free Plan enables you to manage up to 10 apps in your account. If you want to manage more than 10 apps, then you'll need to set up billing by upgrading from the Free Plan to the Premium Plan.

How Astra Control Center works

Astra Control Center runs locally in your own private cloud.

For the first release, Astra Control Center will support OpenShift Kubernetes clusters and Trident storage backends with ONTAP 9.5 and above.

In a cloud connected environment Astra Control Center uses Cloud Insights to provide advanced monitoring and telemetry. In the absence of a Cloud Insights connection, limited (7-days of metrics) monitoring and telemetry is available in Astra Control Center and also exported to Kubernetes native monitoring tools (such as Prometheus and Grafana) through open metrics end points.

Astra Control Center is fully integrated into the AutoSupport and Active IQ ecosystem to provide users and NetApp support with troubleshooting and usage information.

You can try Astra Control Center out using a 90-day evaluation license. The evaluation version is supported through email and community (Slack channel) options. Additionally, you have access to Knowledgebase articles and documentation from the in-product support dashboard.

To install and use Astra Control Center, you'll need to meet certain [requirements](#).

At a high level, Astra Control Center works like this:

- You install Astra Control Center in your local environment. Learn more about how to [install Astra Control Center](#).
- You complete some setup tasks such as these:
 - Set up licensing.
 - Add your first cluster.
 - Add backend storage that is discovered when you added the cluster.
 - Add an object store bucket that will store your app backups.

Learn more about how to [set up Astra Control Center](#).

Astra Control Center does this:

- Discovers details about the managed Kubernetes clusters.
- Discovers your Astra Trident configuration on the clusters that you choose to manage and lets you monitor the storage backends.
- Discovers apps on those clusters and enables you to manage and protect the apps.

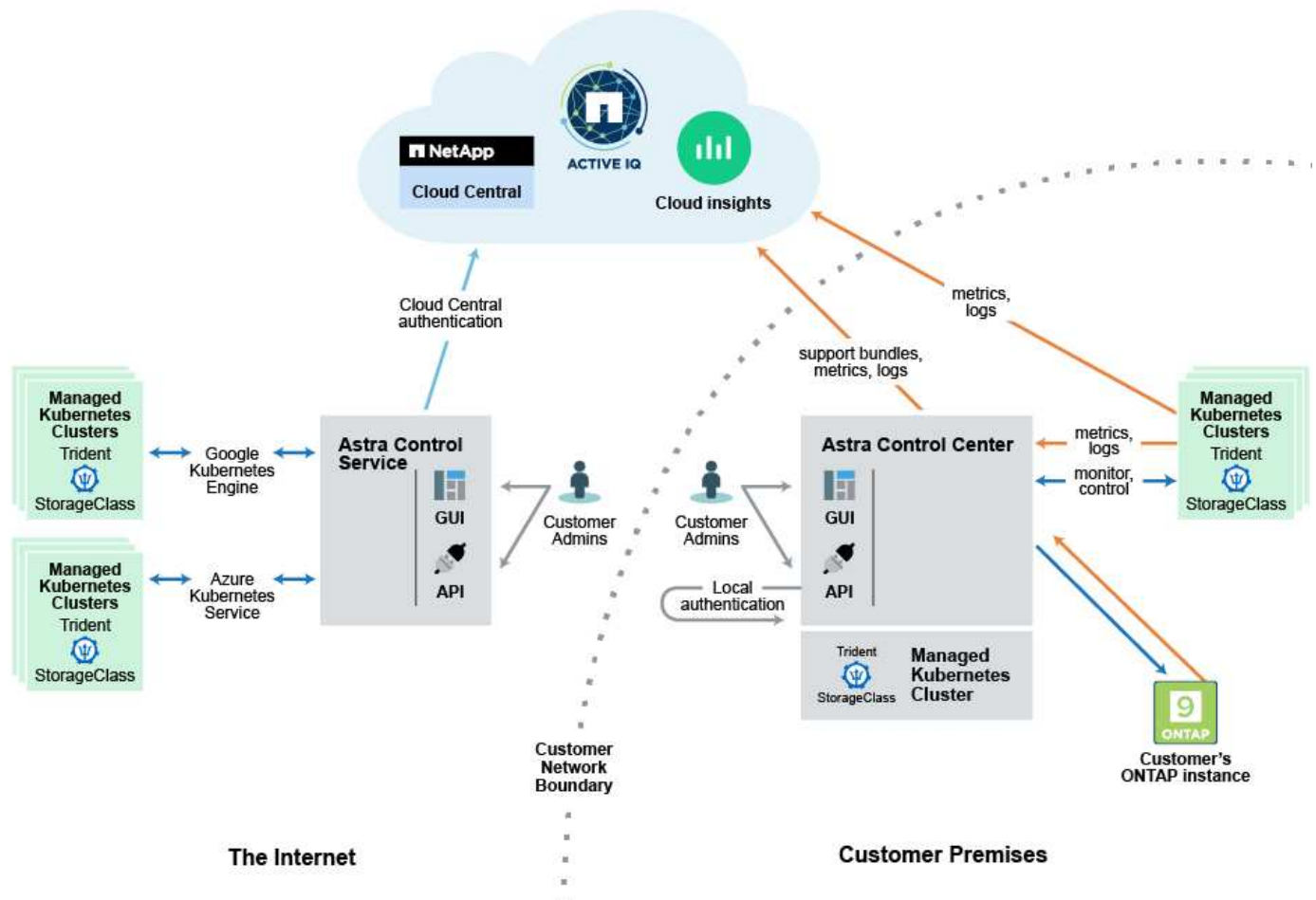
You can add apps to your cluster. Or, if you have some apps already in the cluster being managed, you can use Astra Control Center to discover and manage them. Then, use Astra Control Center to create snapshots, backups, and clones.

For more information

- [Astra Control Service documentation](#)
- [Astra Control Center documentation](#)
- [Astra Trident documentation](#)
- [Use the Astra API](#)
- [Cloud Insights documentation](#)
- [ONTAP documentation](#)

Architecture and components

Here is an overview of the various components of the Astra Control environment.



Astra Control components

- **Kubernetes clusters:** Kubernetes is a portable, extensible, open-source platform for managing containerized workloads and services, that facilitates both declarative configuration and automation. Astra provides management services for applications hosted in a Kubernetes cluster.
- **Astra Trident:** As a fully supported open source storage provisioner and orchestrator maintained by NetApp, Trident enables you to create storage volumes for containerized applications managed by Docker and Kubernetes. When deployed with Astra Control Center, Trident includes a configured ONTAP storage backend.
- **Storage backend:** Astra Control Service uses [NetApp Cloud Volumes Service for Google Cloud](#) as the backend storage for GKE clusters and [Azure NetApp Files](#) as the backend storage for AKS clusters.

Astra Control Center uses an ONTAP AFF and FAS storage backend. As a storage software and hardware platform, ONTAP provides core storage services, support for multiple storage access protocols, and storage management functionality, such as snapshots and mirroring.

- **Cloud Insights:** A NetApp cloud infrastructure monitoring tool, Cloud Insights enables you to monitor performance and utilization for your Kubernetes clusters managed by Astra Control Center. Cloud Insights correlates storage usage to workloads. When you enable the Cloud Insights connection in Astra Control Center, telemetry information shows in Astra Control Center UI pages.

Astra Control interfaces

You can complete tasks using different interfaces:

- **Web user interface (UI):** Both Astra Control Service and Astra Control Center use the same web-based UI where you can manage, migrate and protect apps. Use the UI also to manage user accounts and configuration settings.
- **API:** Both Astra Control Service and Astra Control Center use the same Astra Control API. Using the API, you can perform the same tasks that you would using the UI.

Astra Control Center also enables you to manage, migrate, and protect Kubernetes clusters running within VM environments.

For more information

- [Astra Control Service documentation](#)
- [Astra Control Control documentation](#)
- [Astra Trident documentation](#)
- [Use the Astra API](#)
- [Cloud Insights documentation](#)
- [ONTAP documentation](#)

Validated vs standard apps

There are two types of applications you can bring to Astra Control: validated and standard. Learn the difference between these two categories and the potential impacts on your projects and strategy.



It's tempting to think of these two categories as "supported" and "unsupported." But as you will see, there is no such thing as an "unsupported" app in Astra Control. You can add any app to Astra Control, although validated apps have more infrastructure built around their Astra Control workflows compared to standard apps.

Validated apps

Validated apps for Astra Control include the following:

- MySQL 8.0.25
- MariaDB 10.5.9
- PostgreSQL 11.12
- Jenkins 2.277.4 LTS and 2.289.1 LTS

The list of validated apps represents applications that Astra Control recognizes. The Astra Control team has analyzed and confirmed these apps to be fully tested to restore. Astra Control executes custom workflows to help ensure application-level consistency of snapshots and backups.

If an app is validated, the Astra Control team has identified and implemented steps that can be taken to quiesce the app before taking a snapshot in order to obtain an application-consistent snapshot. For example, when Astra Control takes a backup of a PostgreSQL database, it first quiesces the database. After the backup is complete, Astra Control restores the database to normal operation.

No matter which type of app you use with Astra Control, always test the backup and restore workflow yourself to ensure that you can meet your disaster recovery requirements.

Standard apps

Other apps, including custom programs, are considered standard apps. You can add and manage standard apps through Astra Control. You can also create basic, crash-consistent snapshots and backups of a standard app. However, these have not been fully tested to restore the app to its original state.



Astra Control itself is not a standard app; it is a "system app." Astra Control itself isn't shown by default for management. You should not try to manage Astra Control itself.

Storage classes and persistent volume size

Astra Control Center supports ONTAP as the backend storage. You should understand how storage class and persistent volume (PV) size can help you meet your performance objectives.

Overview

Astra Control Center supports only Trident storage classes backed by ONTAP storage at this time. Astra Control Center discovers and uses the already-deployed resources, including ONTAP, Trident, and associated storage classes.



Trident storage classes should be preconfigured outside of Astra Control Center.

Storage classes

When you add clusters to Astra Control Center, you're prompted to choose one of the previously discovered storage classes for persistent volumes. Service levels in storage classes are designed for different capacity and bandwidth needs. These discovered storage classes are eligible for use within Astra Control Center.

Persistent volume size and performance

See Trident information that provides cost comparisons and examples that can help you better understand how to couple a service level with volume size to meet your performance objectives.

Find more information

- [Trident documentation on storage configuration](#)

Copyright information

Copyright © 2024 NetApp, Inc. All Rights Reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP “AS IS” AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

LIMITED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (b)(3) of the Rights in Technical Data -Noncommercial Items at DFARS 252.227-7013 (FEB 2014) and FAR 52.227-19 (DEC 2007).

Data contained herein pertains to a commercial product and/or commercial service (as defined in FAR 2.101) and is proprietary to NetApp, Inc. All NetApp technical data and computer software provided under this Agreement is commercial in nature and developed solely at private expense. The U.S. Government has a non-exclusive, non-transferrable, nonsublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b) (FEB 2014).

Trademark information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.